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THE MIAMI CONSERVANCY BULLETIN

NOVEMBER 1919

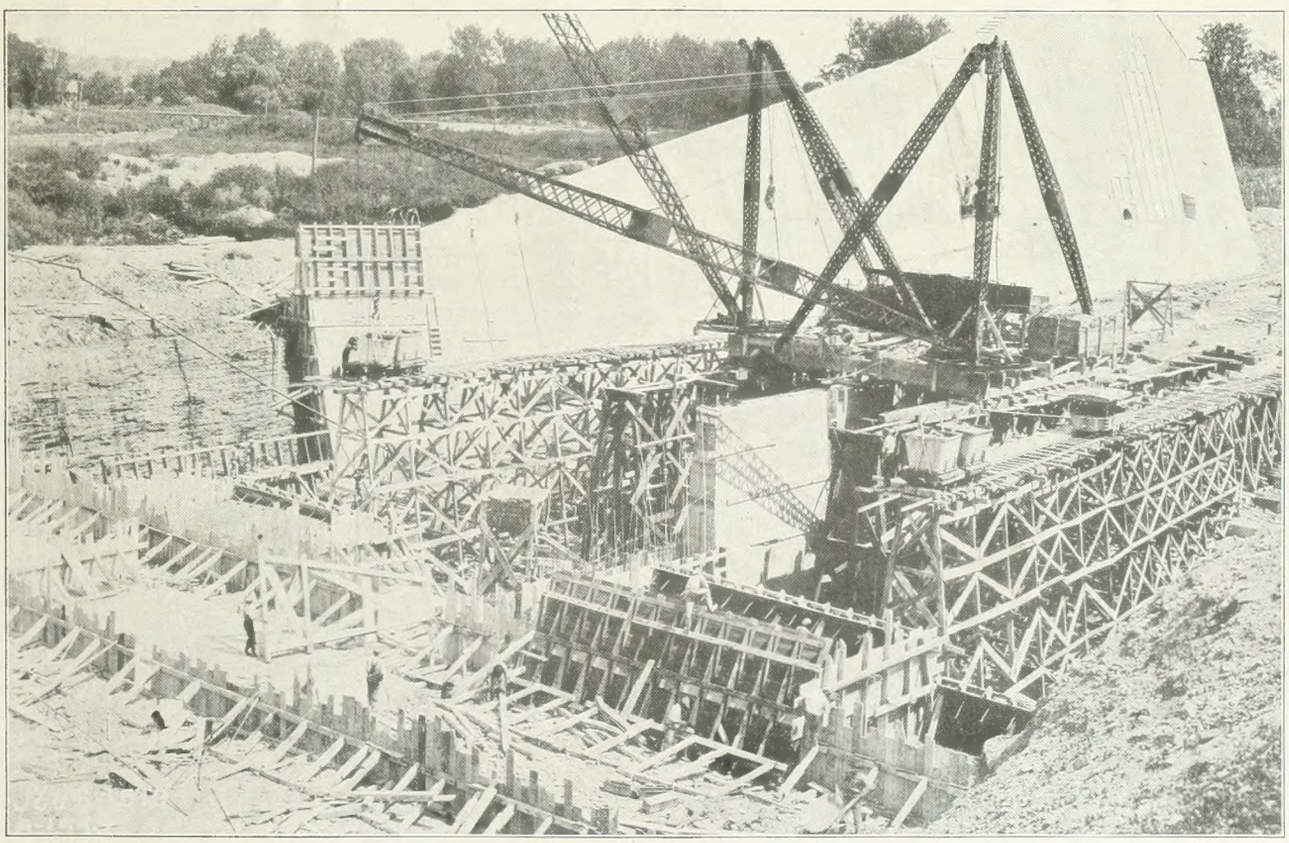

FIG. 42—BUILDING THE OUTLET STRUCTURE AT HUFFMAN DAM, AUG. 15, 1919.

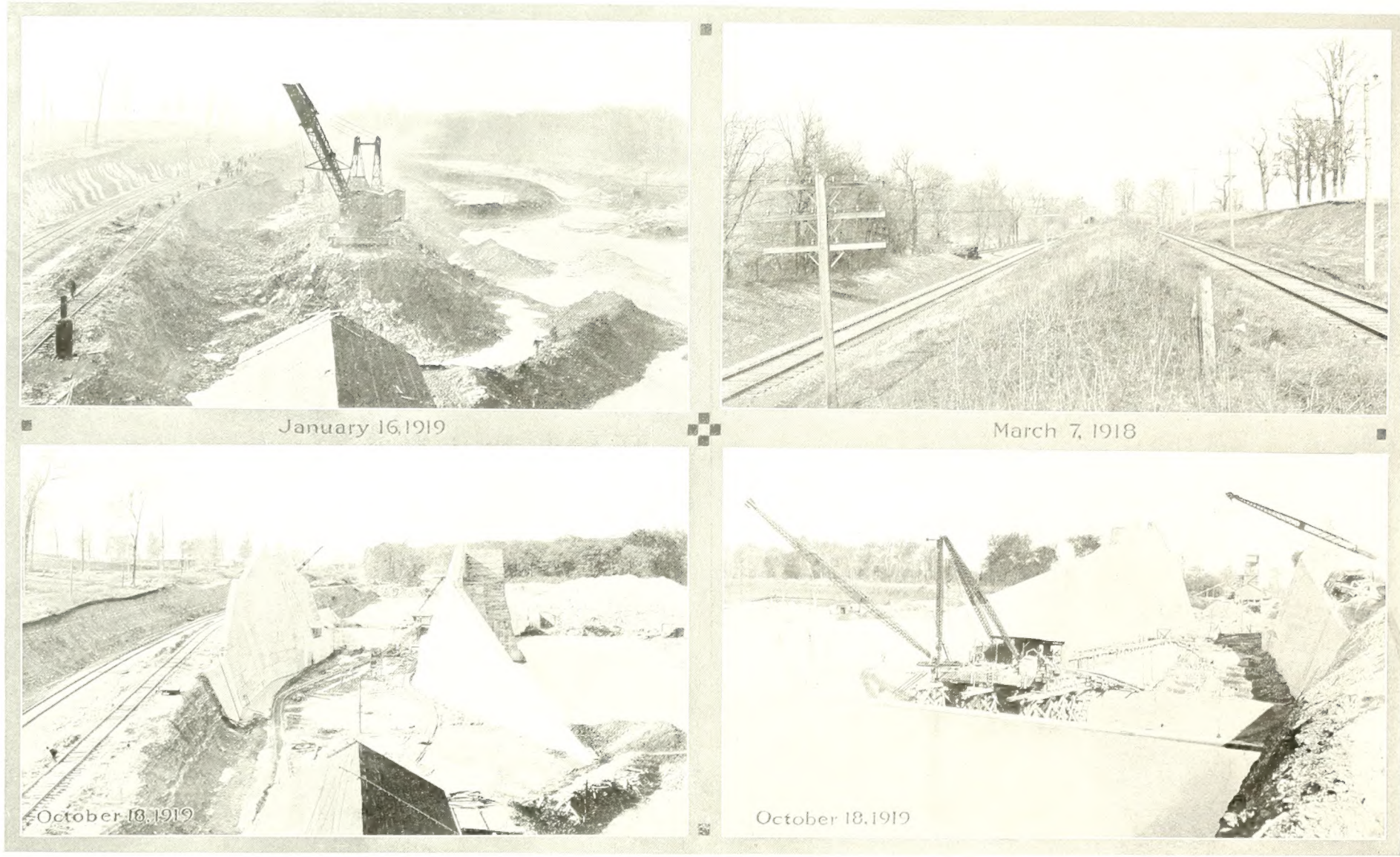

FIG. 43—A RECORD OF PROGRESS AT HUFFMAN DAM OUTLET WORKS.

The two left hand views were taken from the top of the gravel washing plant, looking down stream, and show the progress made during the past nine months. The two right hand views show the same locality, but look upstream. The changes that have taken place at Huffman in a year and a half as revealed in these two pictures, are truly remarkable. The upper right view shows the Big Four Railroad track at the left and the Ohio Electric Railroad track at the right, as they existed originally. The lower right hand picture is taken from the same spot, and covers the same field of view, except that the camera should have taken in about one inch more on the right to match the picture above.

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THE
MIAMI CONSERVANCY BULLETIN
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DAYTON, OHIO

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Mad River Will Be Made to Flow Through a Concrete Structure 67 Feet Wide, with Walls 70 Feet High.—By C. C. Chambers.

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Subscription to the Bulletin is 50 cents per year. At news stands 5 cents per copy. Business letters should be sent to Office Engineer, Miami Conservancy District, Dayton, Ohio. Matter for publication should be sent to G. L. Teeple, Miami Conservancy District, Dayton, Ohio.

Second Annual Conservancy Assessment

The Taxation Department of the District has just finished the Tax Duplicate for the collection of the second annual installment of the Conservancy assessment. The preparation of this annual duplicate requires between six and seven months, and represents the combined labor of about fifteen persons. Triplicate copies of thirty tax duplicates have to be prepared and made ready for the bindery. In addition, forty-seven bound volumes of Tax Receipts to be used with these duplicates have to be filled out. The fifty thousand odd calculations involved were made on two Monroe calculating machines and two adding machines. These were in constant use for a period of five months. Four columns of figures are carried on each page, and each column must balance before the page is passed.

Three weeks were required to complete the delinquent tax records, and have them ready for the bindery. The penalties were all calculated and carried forward in proper columns as of August 31, 1919. These records, which also have just been completed, present some remarkably favorable figures. Out of the total collection for the year in Montgomery County but 1.98 per cent has been returned as delinquent, and of this amount only about one per cent remains delinquent as of October 1, 1919. Butler County with 1.42 per cent, Warren County with 0.85 per cent and Miami County with 2.41 per cent, is the record of the other counties. The average rate of delinquency for the entire District is 1.8 per cent. To those familiar with the collection of special assessments on the general tax duplicate, this is a remarkable showing. Such collections frequently run as high as 10 or 12 per cent delinquent. The result in this case is therefore all the more gratifying. The total collection for the past year was about $1,800,000.

All tax records relating to the 1919 collection of taxes are now completed and filed with the proper county officials. These collections start on December 20 of this year, and end June 20, 1920. The rate this year is 5.6 per cent of the total assessment, as against 6.8 per cent last year, the decrease being due to the fact that the interest requirements are not quite as heavy as a year ago. When the balance of the bonds of the District are sold, the rate will be about the same as last year.

J. E. Feight, who has had general charge of the operations of the Taxation Department since April, 1918, directed the preparation of the 1919 tax records, assisted by James Shine, chief clerk.

Concrete Block Paving for Dayton Levees Started

A beginning was made October 16, with the placing of flexible concrete block paving along the Miami River at Dayton, just below the Island Park Dam. Here a strip about 400 feet long will be paved over a width of 30 feet along the toe of the east levee, to protect against erosion by the water coming over the dam during high stages. Downstream from this strip, the block paving is to continue over an additional 450 feet, but only 10 feet wide. The levee slope above the block paving is to be protected by a concrete slab revetment.

The flexible concrete block paving and the manner in which it it is fastened together by means of galvanized cables is described in the August issue

of the Bulletin. Figure 133 in the May issue shows the extent and location of concrete protection for the Dayton levees.

Price Brothers, who have had the contract for manufacturing the concrete blocks, completed their work the latter part of October, with a total of 180,000 blocks made.

Progress on the Outlet Works

The completion of the concrete outlet works at Huffman Dam on October 4, marks another mile post in the progress of the Conservancy construction program. The outlet works at four dams are now completed. To be accurate, the structures have been completed as far as the safety of the earth dams under construction now permits. As built, they posses ample capacity to pass flood waters, and safeguard the unfinished earth structures against being overtopped. When the latter reach a safe height, the remainder of the concrete will be placed and the discharging capacity of the outlets reduced to that called for in the Official Plan.

On October 17, the first concrete was placed in the Taylorsville Dam outlets. The heavy rock excavation necessary at the site of this structure has been responsible for its late start. Fig. 44 shows the first buckets full of concrete as they arrived on the job ready to be poured.

The Huffman outlet works and their construction are described in detail in this issue. The relocation of the railroads and highways made necessary by the construction of this dam was one of the more complex problems that had to be solved. Its solution, which has remained a puzzle to many, is clearly brought out in the drawings, Figs. 48, 49 and 50.

Conservancy Cases in Butler County Disposed Of

The 43 Conservancy cases in Butler County, resulting from appeals taken from the amounts of benefits and damages fixed by the Board of Appraisers, have practically all been disposed of. There were only four appeals from damage appraisals and these were readily adjusted some time ago to the satisfaction of both the owners and the District. The remaining 39 cases related to benefits. Only four of these were actually tried out before juries in Judge Harlan's Court of Common Pleas at Hamilton. In each instance the finding of the jury was for the exact amount of benefits fixed by the Appraisers. On October 27, Messrs. Boyd and Burke, attorneys for the property holders, withdrew 15 cases, which added to the 17 cases previously withdrawn by them, made a total of 32 cases dismissed up to date. It is confidently expected that the remaining three cases will be similarly disposed of in the near future.

The Miami Conservancy District is represented by Attorneys W. C. Shepherd and John Neilan of Hamilton, and Ben. Harwitz of Middletown.

Mud as a Fertilizer

So much interest is centering at the present time in the sale of the lands owned by the Miami Conservancy District in the five retarding basins, that it has seemed opportune to call attention in this issue to the increased fertility that is bound to result from the overflow that will take place in after years when the dams are in operation. The office of the Farm Division, at the headquarters building, has found it a big task to furnish information to all those seeking it. Some inquiries about lands were received lately from points as remote as Louisiana and New England. The Farm Circulars, mentioned in a previous issue of the Bulletin, are proving of much assistance in disseminating information, especially to parties in distant localities. The article in this issue on the value of river mud as a fertilizer, reviews at length the contents of Circular No. 2, which has some interesting facts in it not generally known.

Visit from Australian Engineers

Two noted Australian engineers visited the Conservancy District during the month. They were W. Farrow, general manager of the underground railway system and terminal station being built at Sidney, Australia; and A. Farrow, also of Sidney, who has the contract for the enlargement of the Murrumbidgee Irrigation works. This latter project extends over a distance of 68 miles and involves the moving of 4,000,000 cubic yards of earth. Mr. A. Farrow was particularly interested in our use of dragline excavators, which he thinks will be adapted to his work. Both men had read about the work being done by the District in the Conservancy Bulletin, before they left their native shores.

Progress Reports for Work at Smaller Cities

The activities of the Department of Engineering and Construction at the smaller cities in the Valley, have increased lately to a point where it will become of interest to print in the Bulletin the monthly reports of progress at the various localities. Beginning with this issue, there will appear regularly reports by F. G. Blackwell, Assistant Engineer, covering the work at Miamisburg, Franklin and Middletown. As soon as the operations now being started at Troy are under way, monthly reports for that locality will be supplied by E. W. Lane, Assistant Engineer.

A Heavy October Rainfall

The rainfall of October 26 and 27 amounting to from one and a half to two and a half inches over the Miami Valley, caused rises of from two to six feet in the various streams. However, no damage was done to any of the construction equipment or to any part of the flood protection work of the District. The absorptive condition of the soil, at this time of the year, prevented a rapid runoff. Higher stages would have resulted had this rain fallen in the winter or early spring on saturated ground.

China Has Conservancy School

Word comes from the president of the University of Nanking, China, advising that his institution has a "Waterways Conservancy Engineering School." He requests that the Miami Conservancy Bulletin be sent regularly to the university library. This is the third Chinese school of learning that has sent for literature published by the District. The establishment of a conservancy school at Nanking is indicative of the nation-wide importance which attaches to the reconstruction of China's inland waterways. The Grand Canal, alone, presents a stupendous problem.

The Value of River Mud as a Fertilizer

How River Mud, the Greatest of all Fertilizers, will Benefit the Lands in the Retarding Basins.

The great value of mud or silt as a fertilizer when deposited on overflowed lands by floods, has not in this country received the recognition that it has in the older civilized sections of the globe. The reason for this is obvious.

When our forefathers began farming in the New England states, they found a virgin soil. As time went on and civilization spread southward and westward, the fertility of the American farm became proverbial the world over, and excited the wonder of the peoples of Europe, where the soils will yield crops only in return for thorough fertilizing. With characteristic American profligacy we have tilled our soil and reduced its productivity until we also find it necessary to apply fertilizer, and do all those things which nowadays are recognized as indispensable to prevent the soil from becoming impoverished. Stable manure is the best fertilizer the farmer can use, but he never can get enough. Leguminous green manure crops and mineral fertilizer must eventually make up the shortage. But the purchase of mineral fertilizer and the use of land to grow green manure are both expensive, and although in the end the consumer must pay the cost, nevertheless, any farmer who can avoid this expense, in whole or in part, possesses an advantage over the farmer who can not. In some of our southern states, this summer, the cost of fertilizer constituted nearly twelve per cent of the price paid the farmers for their cotton.

The only lands known which have been maintained in fertility despite years, sometimes thousands of years of continuous cropping, without the artificial application of fertilizing materials, are those which are subject to periodical submergence by the flood waters of a silt-carrying stream.

Probably the most historic thing of its kind in the world is the cultivation of the delta lands of the Nile River, kept fertile by the annual overflows. Here crops have been grown without any fertilizer other than that left by the river, not only for a few paltry thousands of years, but for nearly 20,000 years and possibly longer.*

The mud deposits of the Nile have in the course of time grown to an enormous thickness. Remains of some of these earliest agriculturists and of some of their pottery have been unearthed at the southern apex of the Nile delta at depths of seventy and more feet below the present surface level.

In the United States, in a few localities, farmers have not been slow to reap the benefits of river deposits left on their lands by overflow. In the Miami Valley the Ballentine Farm, about a mile southwest of Franklin, Warren County, Ohio, is an interesting example. This farm, according to Mr. C. F. Thirkield, of Franklin, has been owned by his family for over a hundred years. A field of about eighty acres in the southwest corner of the farm, where Clear Creek empties into the Miami River, has the astonishing record of having produced on an average of 75 bushels of corn to the acre for the last 56 consecutive years, without requiring artificial fertilizer of any kind This ideal condition is directly attributable to the fact that the Miami River goes out of its banks almost every year, either in January, February or March, and covers this field for a few days, leaving upon it a small silt deposit containing the very elements essential to corn production. During sixty years Mr. Thirkield recalls but once that any damage whatever was done to a crop by a late flood; and even in that instance, by replanting in June and hogging off in the fall, the field still showed a handsome profit.

East of the 80-acre field is a smaller tract, lying much higher, which was never known to be overflowed till the big flood of 1913, when it was submerged. This latter field has been handled in the ordinary way, receiving its share of farm manure and its periodical meal of fertilizer; it had been rotated in corn, wheat, clover, etc., and returned in yields just the ordinary expectation. After the 1913 flood this field was planted in wheat — and the "wheat grew so rankly it fell over and was almost impossible to reap. It has yielded 35 bushels of wheat per acre since."

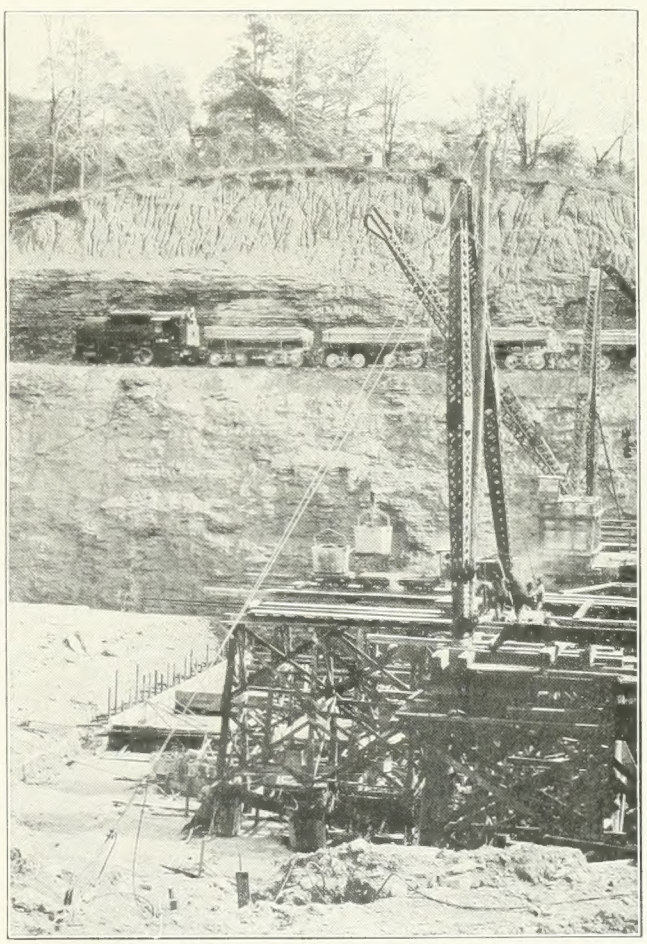

FIG. 44—TAYLORSVILLE'S FIRST CONCRETE

This shows the first buckets full of concrete going into the foundation of the outlet for the Taylorsville Dam, at its extreme downstream end, where the structure is 206 feet wide between rock faces. October 17, 1919.

*The Origins of Civilization, by Prof. James H. Breasted, The Scientific Monthly, October, 1919.

Many other similar instances are on record in the Miami Conservancy District.

In order to focus attention on the great value of river mud, as a fertilizer, the Miami Conservancy District has recently published Farm Circular No. 2 entitled "The Beneficial Effect of Backwater Overflow on Agricultural Lands." This pamphlet, the second of a series of circulars issued by the District in connection with the sale of the 30,000 acres lying within its retarding basins, will prove of special interest to prospective purchasers of these lands. Much of the information contained in it was brought together from various sources, principally foreign ones, by S. Graham Smith, head of the Farm Division. The following, in part has been taken from the Circular:

The effect on the productivity of the lands overflowed within our retarding basins may be estimated from the experience in Europe with backwater above retarding dams, and from the history of overflow along streams both here and abroad.

In Europe retarding dams have been in use a long time. About the year 1711 there were built on the head waters of the Loire River, in France, three retarding dams for the purpose of reducing the size of floods in that stream. One of these at Pinay, about seven miles above the city of Roanne, best serves as an example, since above this dam there is a plain of considerable extent quite suitable for agriculture, and regularly and intensively cultivated. In the flood of 1856 this dam raised the level of the water above the plain 70 feet and stored temporarily on this farm land 3531 million cubic feet of water. This is some 300 million cubic feet more than the Germantown Basin would contain if a flood of the magnitude of the immense one of March, 1913, were repeated after the completion of the dam, and is nearly 500 million cubic feet more than the Lockington Basin would contain if full, level with its spillway.

An official report on the Pinay Dam has been received from the President of Council, Minister of Foreign Affairs, dated May 24, 1916, more than 200 years after this dam was built, from which the following information was obtained:

Since the construction of the dam great floods have occurred in 1790, 1846, 1856, 1866 and 1907. The greatest of these was that of 1846, during which the lands above the dam were flooded for about 16 hours, and a total of 6180 acres was submerged.

The silt deposit left on the land varied from 8 inches in depth where the land is protected by submergible levees which require the flood waters to back in from below, to 1.2 inches on lands not thus protected. In the 200 years during which the dam has been in operation vegetable matter has accumulated in places to a depth of over 6 feet.

These deposits have proved very beneficial to the crops, and the lands flooded need no other fertilizer. The price of these lands runs as high as $485 per acre, and averages $400. Similar lands not flooded by the dam are valued at $325 per acre.

The crops grown are cereals, beets, potatoes, and fodder crops. In the case of cereals and beets the returns from the flooded lands are estimated to be at least fifty per cent above those obtained from similar lands not flooded, while in the case of potatoes the yield is one-third greater.

Lands exposed to rapid currents when flooded are not cultivated but are maintained as meadows.

Of special interest is the fact that the principal floods occur in the summer and fall, and are therefore likely to damage or destroy crops. In spite of this the improved yield of the land in after years more than compensates for such losses, as is evidenced by the increased value of the land.

In contrast with this, the flood season on the Miami River is in the late winter and early spring. It is rare for large floods to occur here during the crop-growing season, as will be seen by reference to figure 45, which shows the acreage in the various retarding basins that would have been submerged by floods during the 25-year period 1893-1917, assuming that the dams had been in operation.

The "Handbuch der Ingenieur Wissenschaften," or Handbook of Engineering Science, which is one of the best known authorities on engineering science, repeatedly refers to the fertilizing action of the silt deposited by floods. The following statements are taken from this authority:

A flood occurring in a river passing through farming country, if it overflows before growing time begins, is very beneficial. It deposits silt and increases productiveness. A meadow thus overflowed requires no other fertilizer, and the low meadows of the Weser, Elbe, and Rhine generally produce three crops a year, or are used as pastures of inexhaustible fodder.

It is known that the natural silt-fertilizing of the stream valleys between the levees steadily proceeds, * * * * * that the silting of the meadows stops after the diking (which prevents overflow by floods) and hence the soil requires artificial fertilizing, * * * * * while the fruitful silt flows by the meadows unused.

Scholars, farmers, and technical experts have for many centuries called attention to the loss by the carrying away of fruitful silt into the sea, and Torricelli declared in the middle of the 17th century that the silt of the rivers was as valuable as gold sand.

A regulated application of the fertilizing flood water tends to increase the productiveness of the lowlands.

The diked-in lowlands are deprived * * * * * especially of the silt which was deposited during floods. A falling off in the agricultural products occurs, especially upon these areas which are used as pastures and are not fertilized. In contrast thereto the profits on the areas outside the levees are very great in all places when the silt remains as deposited. They often furnish more than double the returns of the areas diked-in, without having to carry their burdens (of fertilizer expense.)

The value of flooding is so clearly recognized in Germany that when the improvements of the Rhine above Mannheim were carried out, the levees were lowered sufficiently so that "the newly made lands are regularly overflowed by the ordinary floods for fertilizing purposes." The large Waldeck Reservoir on the Eder River, a tributary of the Weser in Western Germany, was completed in 1913. In order that the lowlands below the dam might not lose the fertilizing action of the annual overflow of floods, the dam is so designed as to let out enough water to submerge these bottom lands.

The flood protection work on the Durance River in Southeastern France is described in a paper presented in Annales des Ponts et Chaussees, 1892. These works were built after the great flood of 1843. They consist of cross dikes running across the lowlands from high ground out to the edge of the normal channel, where they have T-shaped ends. The author states that as a result of these works, the stream has been kept in a fixed channel. Overflow

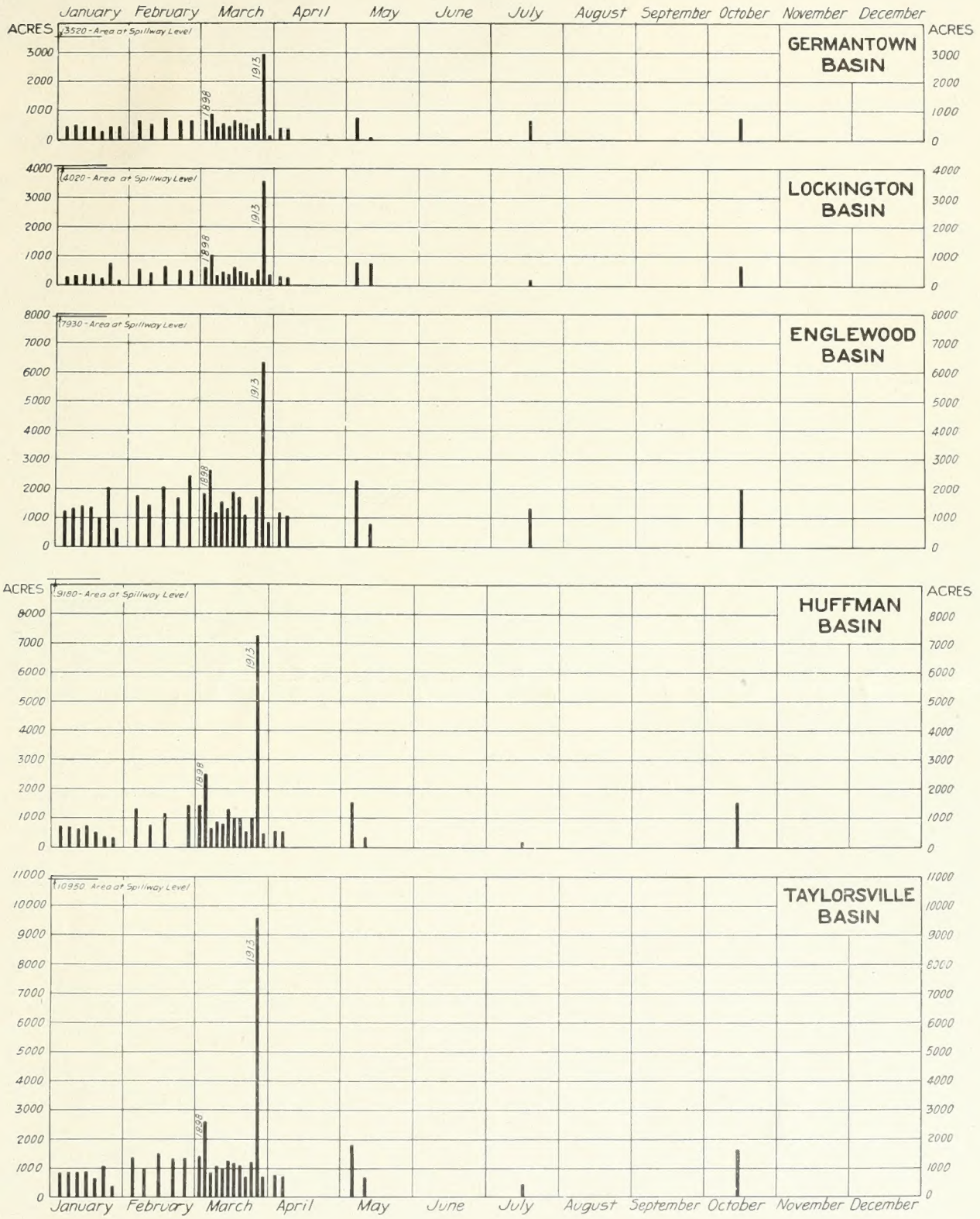

FIG. 45—AREAS FLOODED WITHIN THE RETARDING BASINS

Had our dams been completed in 1893 the amount of land overflowed by floods during the 25-year period 1893-1917 would have been as shown in the diagram. Each flood is represented by a heavy line, the height of which indicates the number of acres overflowed. Floods are grouped by months; thus, in the January space the 7 lines represent all the January floods that have occurred in that 25-year period, and so on. The diagram brings out strikingly how few floods happen during the growing seasons. Of the 30 floods shown, 24 occurred during January, February and March; and one-half of these occurred between the first and last days of March. There is a notable scarcity and even absence of floods during the spring, summer and fall. A flood like that of March, 1898, is likely to occur on an average once in 15 years; one like that of March, 1913, not as often as once in a century.

has taken place between the transverse dikes, but with quiet water, which has left deposits valuable for agriculture.

In reply to an inquiry addressed to the Agricultural Experiment Station of one of our leading corn states, at the head of whose soil department is a man recognized as a national authority on soil fertility, we have received the following:

> There is no doubt but that during annual overflows an immense amount of fertility is deposited in the sediment that is carried by the streams, and if this continues, even with the heaviest cropping that can be given, there is no danger whatever of depleting the land of its fertility. This will increase the yield, and men on such land as that can perhaps afford to lose a crop occasionally, if these losses do not occur too often. An inch of sediment deposited in ten years would undoubtedly carry sufficient phosphorus and potassium to more than supply the crops that would be raised during that time.

And from an answer to a letter addressed to the financial representative of a very large insurance company which has tens of millions of dollars loaned on farm mortgages, we quote:

> I am somewhat familiar with the Miami Conservancy District's work, building dams, above which in flood time the land would be perhaps covered with water for a few days only, and I am of the opinion that it enhances the value of the land very much, and I so informed the Company recently in answer to an inquiry on the same subject.

From a letter written by one whom we believe to be the highest and best authority in Tennessee, we quote in part:

> Our most valuable farm lands are what we call river bottoms which are apt to be overflowed every year, but the overflows are not apt to come at a time which will damage seriously the summer-grown crops. These lands are used chiefly for the production of corn.

The gist of another letter from Kentucky is:

> We have a tremendous quantity of bottom lands in western Kentucky, and while occasionally the crop is lost by a late overflow, say in June or July, in about four years out of five, there is no overflow after corn planting time; so that the risk would be about 20 per cent. These lands are so productive, however, because of the silt deposit on them each year, that a crop of corn can be grown every year, and of course this fact makes them valuable just as the Illinois corn lands are valuable—because corn can be grown on them for such a large proportion of the time.

The United States Government Soil Survey of Montgomery County, in referring to a certain type of bottom soils of the Miami Valley, says:

> It is the manner of their origin, during the many floods of the rivers, which accumulates a thick deposit of mixed sand and silt and vegetable refuse, and gives them their great productive value.

It ought to be added, however, regarding these benefits from flood overflow, that only a part of the Conservancy lands are so situated as to receive them. The farms as offered for sale all have some higher ground for dwellings and barns. The balance, in practically all cases, extends down to the river bottoms where it will be subject to overflow. Of the total area for sale, amounting to some 30,000 acres, during the past 25 years, had the dams been in operation, 20,000 acres would not have been overflowed except by the great flood of 1913, and 23,000 acres would not have been overflowed at all during the crop-growing season, but would have been flooded only in January, February and March. Nevertheless, although only a part of a farm is thus directly benefitted, the benefit indirectly extends to the entire farm, since the manures from crops grown on overflowed lands can be used to fertilize the fields not flooded.

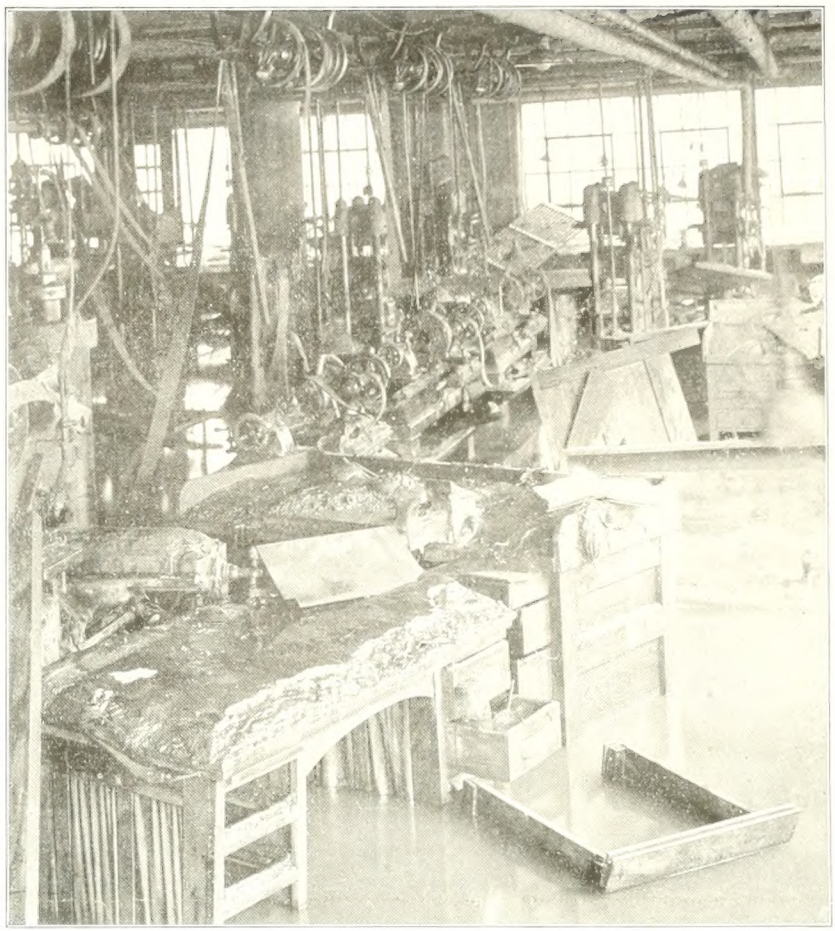

FIG. 46—THE DELCO PLANT AFTER THE 1913 FLOOD

On the desks is a layer several inches thick of the real thing—Miami River mud, just as it was left by the great flood of 1913. The view is in the Delco Plant, and was taken before the last of the water had disappeared and while the mud, still fresh, shone loke frosting on a cake. This mud, landing as it did in a factory full of costly machinery did great damage. If it could have settled out undisturbed on the country lands it would have been a godsend to the farmers. The completion of the dams will make this very thing possible, and the retarding basin lands in the future will be greatly enriched by deposits of this kind.

Farm Circular No. 2 will be mailed free of charge to any one desiring a copy. Write to Farm Division, The Miami Conservancy District, Dayton, Ohio.

Prominent Editor Visits Works

F. E. Schmitt, Associate Editor of Engineering News-Record, has been with us recently, looking over the work of the District.

October Progress on the Work

GERMANTOWN

During the month of September 58,250 cubic yards of embankment were placed in the dam, bringing the total at the end of September to 176,625 cubic yards. This is approximately 21 per cent of the total hydraulic embankment to be placed.

The sluicing from the borrow pit north of the pumping plant is making good progress. The material, mostly clay, can be obtained at a low cost, thus reducing somewhat the total unit cost for placing the embankment.

The Marion dragline is being used to build the slopes of the dam. The material deposited by pumping is replaced by the dragline on the face of the dam in order to more quickly raise the slopes of the dam as a precaution against overtopping by fall and spring floods. Thus far the downstream slope has been graded to five feet above the first berm, across the entire width of the dam.

Work on the spillway has progressed favorably during the past month. To date 8300 cubic yards have been excavated.

Arthur L. Pauls, Division Engineer.

October 15, 1919.

ENGLEWOOD

The four-foot layer of clayey earth, placed over the porous gravel in the river bed to insure water-tightness, has been completed and the dragline moved to the east end of the dam to work on the second location for the dredge pumps.

Work on the cross dam near the easterly bank of the river has continued, but rather slowly, owing to the desire to send a maximum amount of material to the dredge pumps.

During the month of September 93,900 cubic yards of hydraulic fill were pumped into the dam. In addition, 2400 cubic yards of rolled fill were placed in the cross dam, making a monthly yardage of 96,300 and bringing the total to date to 733,000 cubic yards, or 21 per cent of the entire dam.

Work has begun on the second installation of the dredge pumps, favorably located for placing material in the easterly end of the dam.

H. S. R. McCurdy, Division Engineer.

October 15, 1919.

LOCKINGTON

Placing of earth fill in the dam by sluicing and pumping has proceeded satisfactorily throughout the month. A marked improvement in the rate of progress was noted when a better type of pump runner was put in service. The hydraulic fill placed to date is 101,000 cubic yards. A third dredge pump unit is being installed to take the place of one of the cast iron pumps which has given much trouble recently from broken casings.

Instead of protecting the slopes of the dam by a soil dressing and grassing, as first intended, it has been decided to do a part of this by paving the surface with rock furnished by the hydraulic operations. Much of the stone for this is discharged through the pipes with the finer material, and the balance is waste hauled from the borrow pit where the sluiceways must be kept clear from stones. Sufficient stones will probably be available to pave the dam in this way on both slopes to the upper berm.

The western part of the dam, upon the higher ground, is being built at a rapid rate. About 1150 feet of it has been completed to full height, and by the end of November it is expected that it will all be completed, making a total of 3325 feet. This is being built by the Class K Lidgerwood electric dragline which handles a 3½ cubic yard bucket. The material which goes into the central part of the dam is being wetted before it is dug from the borrow pit. This wet material which is mostly clay forms the impervious core of the structure. None of the portion of dam built by the dragline is over 26 feet in height.

Excavation for the cut-off trench on the higher ground, for the eastern portion of the dam, has been commenced by the Lidgerwood Class B steam dragline machine using a 1½ cubic yard bucket. The cut-off trench across the bottom ground east of the outlet structure will not be started until late in the spring when danger to the work from high water is past.

The only work done on the roads this month was the building of some guard rails.

Barton M. Jones, Division Engineer.

October 20, 1919.

TAYLORSVILLE

The progress of the Lidgerwood dragline on the outlet works excavation continues to be well ahead of schedule for this work. The deep part of the excavation above the upper weir is very nearly finished, so that from now on the high face will be reduced rapidly because of the upward slope in the bottom beginning at this point. Also the sides are drawing in at a considerable angle, so that the upstream progress should increase rapidly if the same monthly yardage is maintained.

Concreting will start in the lower apron and east wall in a few days.

The sluicing has made about the usual progress. For a few days, to the regular output from the nozzle was added the output from the Marion steam shovel. This earth was dumped into a sort of improvised hogbox about 100 feet from the sump and near the regular ground sluice, and was driven into the ground sluice by a two-inch nozzle. It developed that there were so many large boulders in this material that it would require a revolving grizzly and a derrick to keep this process going, so it was stopped as the earth available for this work would not justify this layout at this time.

Later a six-inch, three-stage pump was installed in the pit so as to take water from the low pressure line. This supplies a two-inch nozzle at 120 pounds pressure. This nozzle is used in the west end of the pit and the three-inch nozzle is in the east end. It appears that this layout will easily justify the extra expense.

The Bucyrus dragline and from one to two dinkeys have been on the ballasting for the B. & O. Relocation. Just recently Roberts Brothers have been able to take the ballast a little faster and this work has been running two shifts.

Kahl Brothers have finished the west approach to the concrete bridge over the B. & O. Relocation, and built an end dike and farm road approach at the east end of this bridge. They have also built that part of the approach of Cedar Road to Road No. 12 on top of the dam, that lies south of the toe of the dam.

O. N. Floyd, Division Engineer.

October 17, 1919.

HUFFMAN

With the exception of the spillway weir, which cannot be built at the present time, the concrete work in the outlet structure was completed on October 4th. This is three days less than seven months from the time the first concrete was poured. The derricks and other plant used in the placing of the concrete are being dismantled, and the structure is being cleaned out preparatory to diverting the flow of the river through this permanent outlet.

Pumping of the hydraulic fill into the dam began on September 25, and is progressing at a very satisfactory rate. The first lift has been placed along the east side from the diversion channel to the Erie Railroad;a pipe line has been carried across the center pool to the downstream toe and the first lift along the west side has been started. The 1½-yard steam dragline is building the levee for the second lift along the east side.

Preparations are about complete for starting the delivery of ballast gravel for surfacing the road bed for the relocation of the Big Four, Erie, and Ohio Electric Railroads. This gravel will be excavated from the main borrow pit in the river valley above the dam with the 4½-yard electric dragline, and transported to the new railroad lines with Huffman locomotives and side-dump cars. This will for a short time interrupt, to some extent, the pumping of material into the dam.

Contractor McCann has a small steam shovel at work on the excavation for the relocation of the Valley Pike, and this work is progressing as the weather permits.

C. C. Chambers, Division Engineer.

October 16, 1919.

DAYTON

Channel excavation to date amounts to 594,600 cubic yards. A total of 435,300 cubic yards has been placed in levees and spoil banks, including 60,000 cubic yards of levee embankment on Contract No. 41. In accomplishing this work a total of 1,034,600 cubic yards has been handled.

The D-16, Class 175 dragline has continued excavation below Dayton View bridge, loading the material on scows, the other large machine, D-15, unloading the material and placing it in the spoil bank below Herman Avenue on the west bank.

The D-19, Class 9½ caterpillar dragline has made the channel excavation required along the retaining wall on the north bank of the river west of Main Street, has placed about 500 cubic yards of gravel at Price Brothers' concrete block plant and is now loading material into cars for the enlargement of the west levee above Herman Avenue.

The retaining wall at Main Street and the wall along the land side of the levee at Hershey Street, have been completed.

Work has been started on the revetment below Island Park Dam. Blocks for the flexible revetment are now being laid. Price Brothers Company drove the piles for this job under contract.

The gravel washing plant has been placed in operation.

The construction plant for the South Robert Boulevard river wall is nearly completed and excavation will be started in a few days.

At Price Brothers' plant approximately 170,000 concrete blocks have been completed, this being 93 per cent of the number required for the Dayton work.

October 17, 1919. C. A. Bock, Division Engineer.

HAMILTON

The total amount of earth handled by the two draglines to October 1, 1919, was 874,000 cubic yards. The total for item 9, including McGillicuddy's contract, was 425,700 cubic yards.

The electric dragline, D-16-18, is taking out the last cut on the east side of the river south of the Columbia Bridge. After completing this cut it will move again to the north of the bridge and work on the higher ground during the winter months. A track is now being laid for hauling this excavation into the spoil bank. A total of 150 tons of old bridge steel has been removed from the river by this machine.

The steam dragline has completed the tailrace and levee between the B. & O. R. R. and the Ford plant, has crossed the B. & O. tracks and started work on the tailrace and levee west of the railroad.

The work of driving the steel sheet piling under the B. & O. bridge over Old River has been 88 per cent completed and the excavation is well under way.

The Front Street sewer has been completed with the exception of the gate manhole. This is the last one of the large sewers and completes the work on Feature 60 with the exception of repaving Wood Street. The derrick used on Feature 60 for excavation will be used to handle gravel for the screening plant, and the remaining plant and organization have been transferred to the concrete wall work on Feature 58.

A stiff leg derrick has been erected and work begun drilling and blasting the remains of the old concrete wall south of the Soldiers' Monument. A new wall will be erected in this location.

October 18, 1919. C. H. Eiffert, Division Engineer.

FRANKLIN

Jeffrey, Boorhem & Company have started excavation in the river nearly opposite the village water works pumping station. At this point material for the levee and the elevation of road approaches will require the throwing of material from the river in two or three moves. The section of the levee between the Cincinnati and Northern Railroad embankment at the pumping station and the suspension bridge will be the first to be built. The machine will then move from the suspension bridge to a point near the north corporation line, leaving a gap in which there is a considerable amount of retaining wall construction. This will probably be built by the District's forces.

MIAMISBURG

Jeffrey, Boorhem & Company have placed the levee embankment on the line north of the Groendyke twine factory, from the high ground at the west to Bear Creek road. This section has a length of about 1,000 feet. The Monighan walking dragline, which was used on this work, has now moved across the Bear Creek road and is loading cars for the levee extending along the west side of the B. & O. Railroad adjacent to the Sycamore street bridge. A small trestle, for the support of the track, was built on the west side of the river embankment. Two dinky locomotives, each with a train of ten 4-yard cars, are hauling the material.

MIDDLETOWN

The cut-off channel which required the excavation of 72,000 cubic yards has been completed by the Cole Brothers Construction Company. Their dragline machine has been moved over to the levee work and the machine is now engaged in the placing of the embankment between Fourth and Sixth streets. Between Fifth and Sixth streets, the presence of the rock in the river bed prevents the construction of the levee in its entirety by the dragline machine. Between these points about 15,000 cubic yards of levee must be hauled in by teams. About 8,000 cubic yards of embankment has been placed in the easterly end of the levee just above and below the Poasttown road.

October 15, 1919. F. G. Blackwell, Assistant Engineer.

RAILWAY RELOCATION

Baltimore & Ohio. Grading is entirely completed on the relocated portion of this railroad. There remain two arches to be built and the old tracks to be elevated north of the connection where the new line departs from the old line, one mile south of Tippecanoe City. The masonry in these culverts is being constructed by Superintendent Leslie Wiley of the District. The raising of the tracks at this point has not been commenced. The Baltimore & Ohio are raising the tracks south of Needmore Road to Leo Street and have the District's portion about 65 per cent completed. Roberts Brothers have completed the tracklaying and have given the ballasting a first lift from Needmore Road to the National Road. Miller Brothers have started building the right-of-way fence.

Big Four and Erie. The grading on these two railroads is rapidly nearing completion. The Walsh Construction Company are excavating in a borrow pit at Harshman, and will complete the embankments between East Dayton and the big cut at Huffman by the first of November, as well as the back fill for the roadbed section in the big cut where the excavation was carried one foot below subgrade because of the rock. After this borrow pit excavation at Harshman is completed the contractors will borrow material at the east end near Enon to widen the narrow embankments at that end.

Tracklaying is under way also, and almost 5 miles of track has been laid on the Erie. The steel rails have all been received and about 60 per cent of the ties have been received. Roberts Brothers are doing the tracklaying, and Walsh Construction Company will start ballasting the track before the first of November.

The overhead concrete arch bridge at Huffman is being constructed by the District with Leslie Wiley in charge as superintendent. The false work is completed, the form work well under way, and the two concrete abutments are completed.

The construction of the fencing is being done by G. S. and C. Funderburg who have three miles constructed to date.

The Big Four bridge department have completed driving the piles for the temporary trestle west of the underpass at Huffman and have part of the framing completed.

Ohio Electric Railway. All the grading and masonry is completed as far as can be done at present. As soon as the Big Four and Erie are diverted to the new line the gap which now exists east of Osborn will be graded. Erection of the steel truss bridge at Mad River is being postponed until the track is laid to this point.

Tracklaying will be the next work to be done, which will be dependent upon the completion of similar work on the Big Four and Erie Railroads.

October 20, 1919. A. Larson, Division Engineer.

RIVER AND WEATHER CONDITIONS

The streams throughout the Miami Valley were comparatively low during the month of September. The rainfall was less than normal, varying from 1.18 to 1.92 inches at the District's stations. At the Dayton Weather Bureau Station the total precipitation during the month was 1.26 inches or 1.24 inches less than normal, raising the accumulated deficiency since January to 2.76 inches.

Information furnished by the local office of the U. S. Weather Bureau at Dayton shows that at Dayton, the mean temperature for the month was 68.8° F., or 2.0° greater than normal; there were 16 clear days, 10 partly cloudy days, 4 cloudy days, and 6 days on which the precipitation exceeded .01 of an inch; the average wind velocity was 8.1 miles per hour, the prevailing direction being from the southwest; and the maximum wind velocity was 47 miles per hour from the southwest on the 19th.

Ivan E. Houk, District Forecaster.

October 20, 1919.

Dayton Gravel Washing Plant

Since about the first of October, the gravel screening and washing plant erected at Sunrise Avenue, near the mouth of Wolf Creek, in Dayton, has been in commission. It is the same plant that functioned at Germantown, having been brought from there knocked down. As now operated, there is no concrete mixing plant in the structure itself. Sand and gravel are merely washed, screened, and stored in bins; it is then hauled in trucks to the site of the work. The scattered nature of the concreting to be done along the river channel in Dayton made such an arrangement necessary.

Germantown Dam Now Capable of Handling Large Floods

The rapidity with which the hydraulic fill at Germantown dam is growing in height is a source of gratification to Conservancy officials. At the close of October the dam had attained an elevation sufficient to enable it to cope with floods as large as that of March, 1898. Floods of this magnitude are not frequent, there being only three on record within the past fifty years.

The Germantown dam is the only one of the five dams in which the hydraulic fill is being placed over the full length of the dam, each lift carrying the entire structure to a new elevation.

The flow of Twin Creek must now all pass through the outlet conduits, the old creek bed being completely blocked by the dam.

Conservancy Farm Sales

A number of sales were effected by the Farm Department during the past month, the lands being located mainly in the Englewood and Germantown retarding basins. Among the larger tracts sold is the one formerly owned by Ira Fudge in the Germantown Basin, in Preble County. Its 268 acres, with the buildings on it, brought $41,000. The purchaser was J. W. Wilson of Middletown, Ohio.

THE McKINLEY PARK SEWER EXTENSION

We publish herewith a picture taken August 12, 1919, of the extension built to the McKinley Park storm sewer at Dayton. The extension was made necessary by an earth fill to correct the irregular alignment of the river bank at that point. At this writing this fill has been placed and the structure is hardly visible, except for its top slab which shows above the water level at low stages.

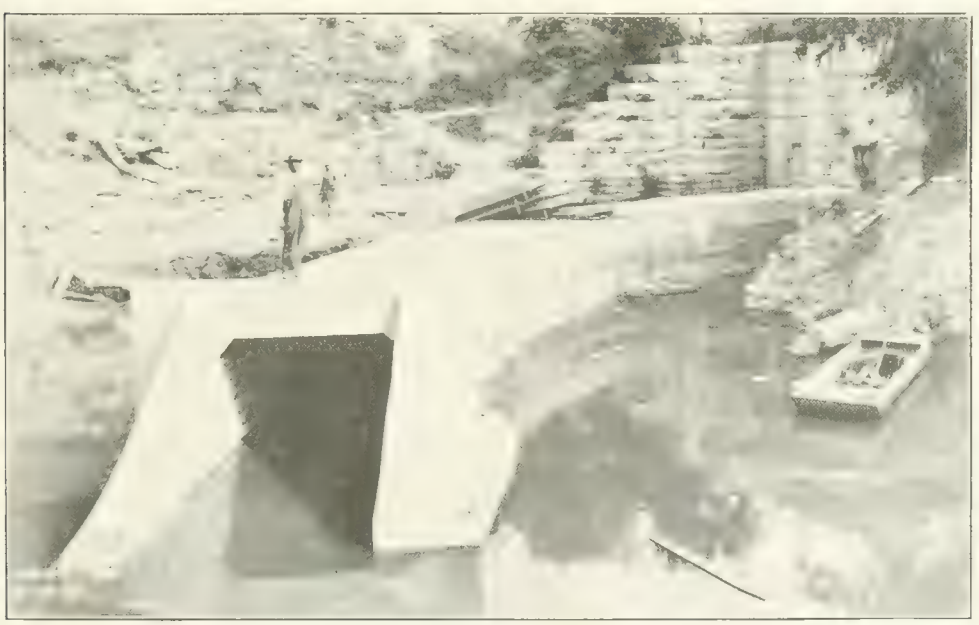

FIG. 47—THE McKINLEY PARK SEWER EXTENSION, AUGUST 12, 1919.

The structure is of reinforced concrete, 8 feet wide by 6 feet high, inside dimensions, with an overall length of 102 feet. It is built on a curve with a radius of 100 feet, and contains 160 cubic yards of concrete. In order to build this extension a cofferdam was constructed and the water within it pumped out. A deep deposit of mud and debris which had collected at the mouth of the sewer, in the course of time, did not present a suitable foundation for the concrete structure. It was therefore necessary to remove this with a dragline excavator and refill the excavation so made with sand and gravel.

The covering up of the old masonry structure which shows in Fig. 47 marks the final obliteration of one of Dayton's historic features, the Tate's mill race, which had its intake at the old Steele dam, and extended down what is now Miami Boulevard and through McKinley Park, emptying into the Miami at this point. It furnished water power to the old Stillwell-Bierce plant. The masonry bulhead originally had four openings in it controlled by iron sluice gates. When the mill race was discontinued, a storm sewer took its place emptying through one of the four openings. The concrete structure built by the District continues this sewer to the toe of the new levee.

The Outlet Works at Huffman Dam

Mad River will be made to Flow through a Concrete Structure 67 feet wide on the Bottom, with Walls 70 feet high.

By C. C. Chambers, Division Engineer

[illegible] Dam is being built across the Mad River Valley [illegible] miles northeast of Dayton. It is a [illegible] dam with a [illegible] outlet structure for passing the flow of the river. One of the [illegible] to be overcome in the construction of this dam has been the readjustment of public [illegible] to the rise of backwater in the basin above it. The dam runs at right angles across the valley and interferes with two railroad lines, one electric interurban line, and two main highways. The Erie Railroad and the highway from Dayton to Springfield, known as the Valley Pike, follow up the north side of the valley; south of the river are the Big Four Railroad, the Ohio Electric Railroad and the Springfield Pike. By referring to the cross section of the valley (see Fig. 48), it is seen that these lines crossed the site of the dam at com-

[illegible] located with great care, thanks to the many borings and test pits put down during the early investigations to determine the extent and nature of the rock formations. As finally planned its north edge projected into the channel of Mad River, its center [illegible] that of the Big Four Railroad track, and its south wall came about [illegible] Ohio Electric Railway track was. The situation can be gaged at a glance from the two right [illegible] which were taken very nearly from the same point.

Serious as were these obstacles, there was little choice in the matter of locating a dam across the Mad River valley. Damsites not only were scarce, but all of them involved interference with railroads and highways. The Huffman site with its high hills on both sides of the valley and large basin capacity was found to be the most advantageous of all. The problem, therefore, consisted of raising and shifting these lines of communication so as not to interfere with the dam and also to change these lines through the basin high enough to prevent their being inundated by backwater in time of floods. In the case of the highways, which allowed of fairly steep grades, the answer was comparatively easy. But the railroads, which were limited to prescribed rolling grades, presented more difficult problems.

The relocation of the Valley Pike involved departing from its present location at a point about one-half mile below the dam, following along the hillside on a 5 per cent grade and reaching the elevation of the top of the dam at the north end of the latter. The road then continues on the north side of the basin, at an elevation high enough to prevent frequent flooding, and joins the old location nearly 5000 feet above the dam. The old Springfield Pike crosses the axis of the dam at the very south end [illegible] roads made necessary a slight shift of this highway west of the dam, and above the dam it follows in a [illegible] existing roads and joining its old location at Fairfield, 5 miles up the valley.

The relocation of the railroads has required the placing of the two main roads, the Big Four and the [illegible] on the north side of the valley, connecting at the yards in East Dayton. They climb on a maximum permissible grade of 3 feet in one thousand, compensated for curvature. Even with this grade they are still 35 feet below the top of the dam where they pass the center line of the latter. In order to prevent leaving a gap in the dam, and to protect the tracks from the backwater, they are taken through a cut in the hill just south of the end of the dam, the north side of this cut forming a barrier to the backwater. Where the railroads emerge from this cut into the basin above the dam, they are protected against flooding by a levee on each side of

FIG. 48—LONGITUDINAL PROFILE TAKEN ON CENTER LINE OF HUFFMAN DAM

This shows clearly the relative positions of the old and new locations of the highways and railroads with respect to the dam and outlet works.

the roadbed for a distance of about two miles up the valley to a point where the road reaches an elevation above flood water. The railroads then continue along the south edge of the basin until they join their former location at Enon, 15 miles northeast of Dayton. A more detailed description of these levees and the cut near the dam will be found in the September, 1918, issue of the Bulletin. The north levee was made to serve also as a roadbed, through the basin, for the Ohio Electric Railway. This line

At Huffman, as at the other dams, one of the main features to be built first was the concrete outlet structure. During its construction the river had to be diverted through a new channel excavated about 500 feet north of the original channel, and cofferdams were built across the latter above and below the structure. To have postponed the building of this concrete structure until the railroads had been moved to their final locations, would have meant a delay of one or two years in its completion, result-

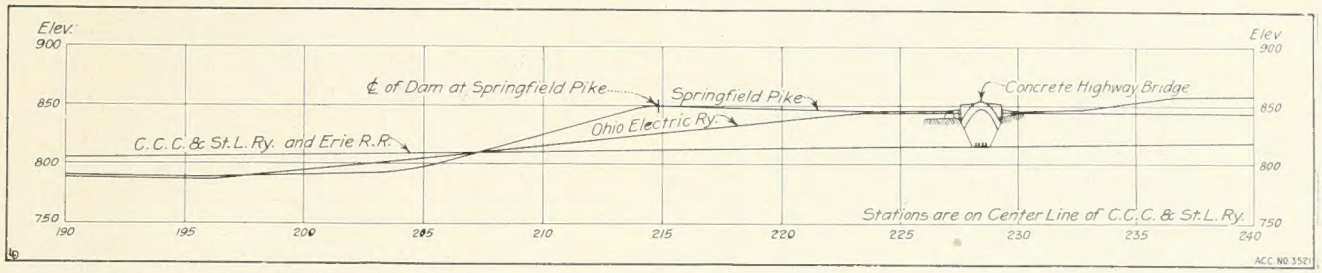

FIG. 49—PROFILES OF RELOCATED RAILROADS AND SPRINGFIELD PIKE SOUTH OF HUFFMAN DAM

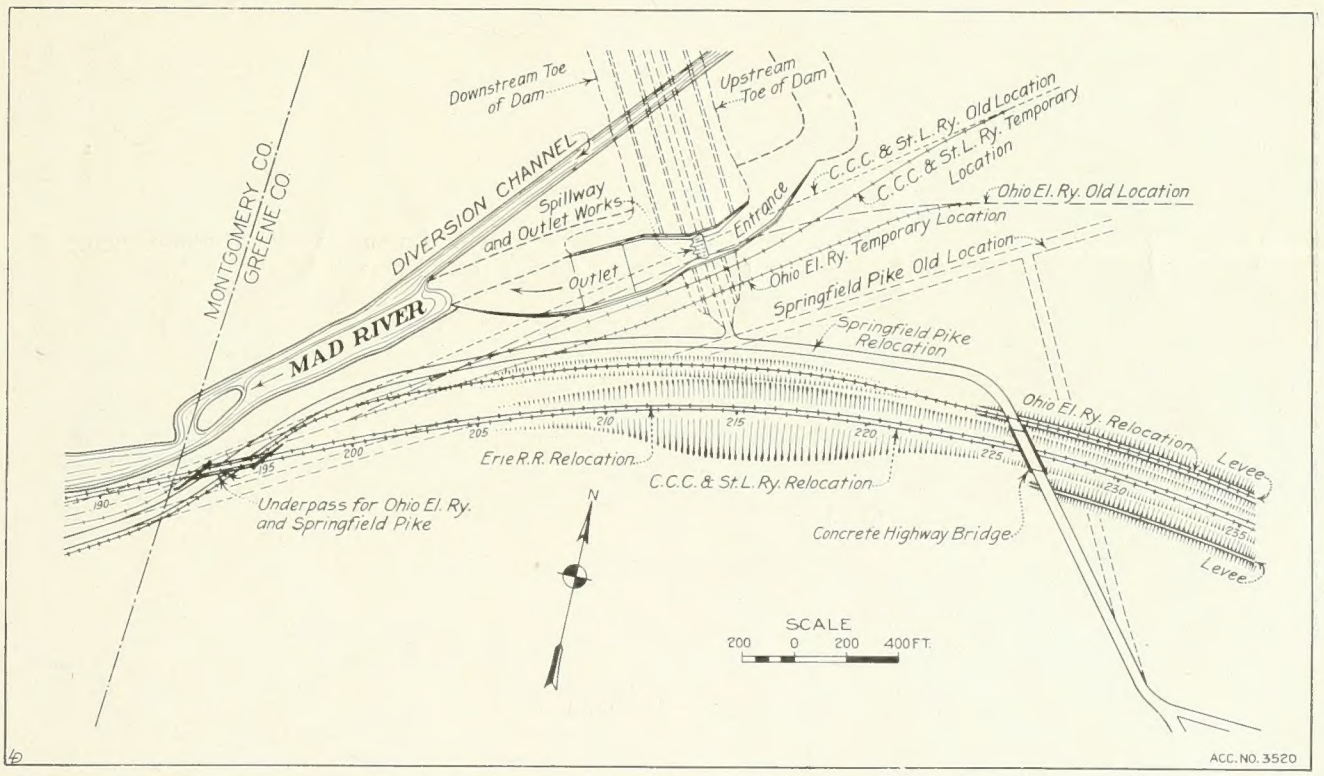

FIG. 50—PLAN SHOWING OLD, TEMPORARY, AND NEW LOCATIONS OF RAILROADS AND HIGHWAY SOUTH OF HUFFMAN DAM

Note the position of the dam and its outlet with reference to the old locations of the Big Four and Ohio Electric Railroads. These roads are now operating on the tracks marked "temporary location," and will soon shift to the relocated tracks.

permits of somewhat heavier grades than the steam railroads, so that it was shifted over to pass around the south end of the dam and onto this levee. The grading for all the railroad relocations has been practically completed at this writing. The traffic will be diverted over the new locations as soon as the track laying and ballasting, now well under way, have been completed. The relocated grades of railways and pike south of the dam are shown in the profile, Fig. 49.

ing in an equally later date for the completion of the entire dam. In order to prevent this delay the Big Four and Ohio Electric railroads were temporarily moved to other locations going around the south side of the structure, as shown in Fig. 50.

The design of the concrete outlet structure is similar to that of the one built at Lockington and described in the August, 1919, issue of the Bulletin. The Huffman structure, however, is much larger than the one at Lockington, and when finished will

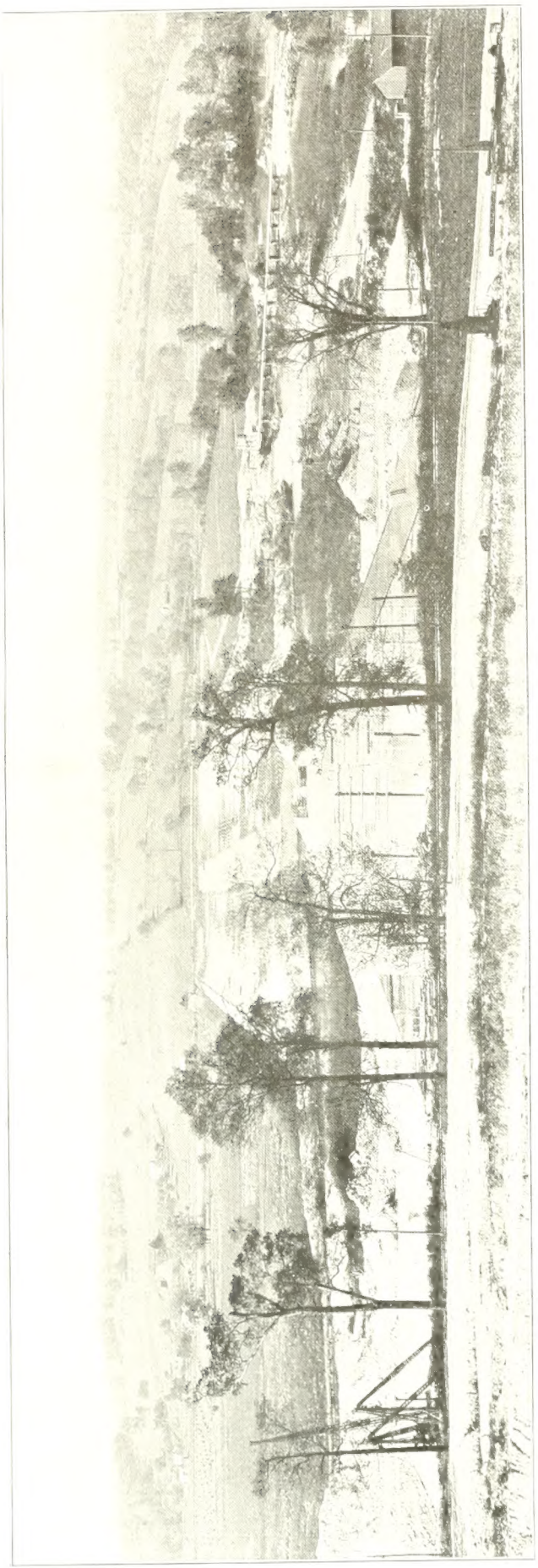

FIG. 51—GENERAL VIEW OF HUFFMAN DAM SITE, LOOKING NORTH, OCTOBER 8, 1919.

have three conduit openings instead of two. These conduits will be 16⅓ feet high by 15 feet wide each, and their joint discharge capacity, in case of a flood like that of 1913, will run as high as 32,600 cubic feet per second.

The foundation for this structure required a heavy rock cut running in places as deep as 65 feet. The rock was drilled and blasted, and the removal of the loose material was affected with an electric dragline. It was loaded onto cars and placed in the fill required to raise the roadbed of the railroads between Dayton and Huffman. The June, 1919, issue of the Bulletin contains two illustrations which show the extent and depth of the excavation made.

The aggregate for the concrete was excavated in the river valley at a point about 2000 feet away, and run through a washing and screening plant, similar in nearly all respects to that used at the other dams. The concrete was mixed and hauled to the distributing derricks with a plant layout similar to the one described for Lockington in the November, 1918, issue of the Bulletin.

The two steel stiff-leg distributing derricks each had a 95-foot boom and were operated by electric hoists. They were mounted side by side on a 40 by 40-foot timber platform, the two side timbers of which formed runners under which 8-inch wooden rollers were placed. The derricks rolled ahead on the finished concrete floor as the work progressed, generally moving about 30 feet at a time. The dragline making the excavation was kept a few hundred feet ahead of the concrete work, and its power was used to pull the derrick platform ahead by means of a long cable fastened to the dragline bucket and connecting with a double block on the front of the platform.

The track leading from the concrete mixer branched just above the derricks, with a line running down each side of the derrick platform. Thus, concrete buckets could be placed alongside of each derrick, and both derricks could be in operation at the same time. All of the concrete now in the structure was placed with the aid of these derricks, including the floor and both walls to their full height. This method was at times supplemented by a small chuting system, whenever it was found necessary to pour the floors some distance ahead of the derricks while the latter were engaged in finishing a high wall section. This system consisted of an elevated hopper, placed as far as the derrick boom could reach, and from which the concrete was run through chutes to the forms, the hopper being fed from a concrete dump bucket suspended from the boom. In this manner all of the floor in the bottom of the stilling pool, and in the steps leading down into this pool, was poured before the derricks were far enough advanced to reach the top of the steps.

The walls were all built in five-foot lifts. The cantilever type of wooden forms was used, built in sections 20 and 30 feet long. These forms were handled with the aid of the derricks, it requiring only a few minutes to remove a section of form and place it in its new location. The placing of concrete began on March 7, 1919, at the upper end of the structure, and proceeded down stream. The last bucket full of concrete was placed on October 4, 1919. The amount

placed in the entire structure during this period was 32,450 cubic yards, making an average rate of progress of 4636 cubic yards per month, or 182 cubic yards per day, not counting Sundays and holidays. The maximum poured on any one day was 321 cubic yards.

The floor elevation of the bottom of the stilling pool is 28½ feet lower than the floor of the conduits on which the derricks were rolled forward. It was found desirable to take the derricks intact on their platform across this pool, in order to place the concrete in that part of the structure below the pool. To do this, trestles were built across the pool maintaining the derricks at the same elevation as the floor of the conduits. An excellent view of the manner in which this was done is given in Fig. 42 on the front cover of this issue.

This view shows also the two lighter trestles, on each side of the derrick platform, which supported the narrow gage tracks for conveying concrete from the mixer to the derricks. One section of cantilever forms may be seen fastened to the upper left-hand corner of the concrete wall.

From the start, Verne Clawson, as Superintendent, has had direct charge of the forces employed on the work, and the writer has been Division Engineer at Huffman.

Men Responsible for Distribution of Supplies and Materials Hold Conference

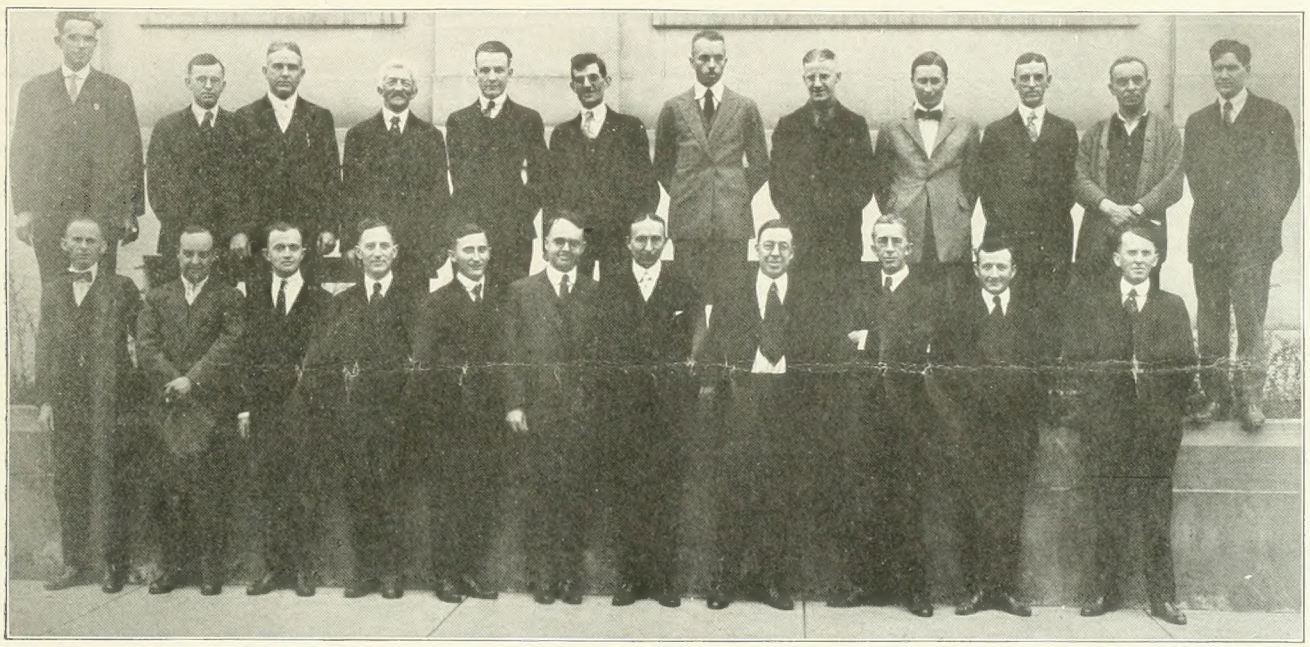

FIG. 52—THE MEN WHO ARE RESPONSIBLE FOR THE DISTRIBUTION OF SUPPLIES AND MATERIALS TO THE CONSERVANCY JOBS. OCTOBER 23, 1919.

Upper row, left to right: F. A. Myers, Warehouseman, Taylorsville; J. E. Eberly, Field Clerk, Taylorsville; H. F. Tressler, Garage Foreman; P. Bjorgum, Warehouseman, Englewood; J. W. Quinlisk, Field Clerk, Englewood; T. N. Nealon, Chief Clerk, Warehouse, Dayton; Herbert S. Dye, Field Clerk, Huffman; Bob Shriever, Warehouseman, Dayton Shop; J. E. Applegett, Warehouse Man, Lockington; J. E. Faist, Office Engineer, Hamilton; John Braun, General Warehouse Foreman, Dayton; C. R. Hooke, Clerk, Accounting Division.

Lower Row, left to right: E. J. Coover, Clerk, Accounting Division; E. J. Holliday, Warehouse Man, Garage; Jesse Horner, Clerk, Accounting Division; Samuel Reed, Clerk, Accounting Division; John T. Hall, Clerk, Dayton Shop; C. N. Phillips, Office Engineer, Headquarters Office; O. K. Welker, Chief Accountant; T. J. Manning, Auditor; H. L. Wall, Consulting Auditor; L. J. McWilliams, Field Clerk, Lockington; Jesse Swihart, Clerk, Accounting Division.

A conference was held, October 23, of the Conservancy men whose activities center in the arduous task of keeping the various construction features supplied with all those material things that are required for the successful prosecution of the work. Anything, from toothpicks up, may be called for, and may be needed on short notice. The receiving, storing, and shipping of supplies and materials, together with the stock keeping and accounting that are necessary in connection therewith, form a big chapter in Conservancy history.

The proper coordination of this phase of the work is one of the prime essentials in conducting a big construction job. Conferences of this sort have been held in the past and have proved of benefit in getting the men acquainted, not only with each other, but with each other's duties and view points. The service which they render cannot be overestimated as to its ultimate value to the organization as a whole. Warehouse and garage men, field clerks, auditors, clerks, and accountants, meet at these conferences, and an intelligent exchange of their opinions is promoted.

The accompanying view was taken on the day of the conference and shows nearly all those in attendance.

Local Flood Protection Work at the Smaller Cities

Until a few months ago but little construction work had been started by the District at the smaller cities of the valley. The policy had been to defer such work, consisting mainly of levee construction and some channel enlargement, to a time when part of the plant and equipment used in the early construction of the dams would become available, unless in the meantime favorable opportunities should offer for the employment of construction firms possessing the requisite amount of equipment. It will be obvious that the extent of the operations to be carried on at the various localities was not sufficient to warrant the purchase of additional equipment by the District. Besides it was felt that even though started later than the big jobs there would be no difficulty in completing this work ahead of the completion of the Conservancy work as a whole.

Lately, construction work at the smaller cities has been steadily increasing, until there is now under way work at Middletown, Franklin, and Miamisburg. A dragline and train outfit is being put in shape for the work to be done at Troy. The protection work at West Carrollton is completed with the exception of a few minor items. The only points at which no operations are being carried on are Piqua and Tippecanoe City.

The first work to be commenced was that at West Carrollton in June, 1918. Because of the necessity of acquiring a portion of the right-of-way through court procedure, an interruption was made from about the middle of September, 1918, until April, 1919. The work which was done by J. I. Geiger was completed on September 2, and is the first feature in the District's work to be completed.

Arrangement for the construction of the levee at Middletown, south of the Cincinnati and Dayton Traction Company's bridge, was made with Donald Jeffrey, who commenced work in October, 1918. Mr. Jeffrey employed for this work a railroad steam shovel converted into a dragline. Except for a comparatively short distance, the levee was put in with one throw of the dragline. It was completed about the first of August, 1919. Arrangement for the remaining earth work at Middletown was made in the spring of this year with the Cole Brothers Construction Company. During the present season the new cut-off channel was built by them and work is now under way on the levee along the river south to Fourth Street, and also at the east end of the protective works in the vicinity of the Poasttown Road. In July of this year Jeffrey, Boorhem & Company were engaged to construct the earth work on the west side of the river at Franklin and Miamisburg. At Franklin a dragline excavator commenced excavation on October 1. At Miamisburg a Monighan walking dragline and a narrow gage crane outfit are being used.

The present outlook is that the work now under way at Middletown will be completed about January 1, 1920. The work on the west side of the river at Franklin and Miamisburg will be completed early in the coming year. Plans have been made for starting construction on the east side of the river at these two localities. At all of the towns mentioned the construction operations now arranged for are confined to earth work. The concrete flood gate structures, retaining walls, street paving, etc., will be handled by a separate force which will be organized in the near future. The work to be done at Tippecanoe City will be started sometime next year so as to insure its completion by the time the Taylorsville Dam is completed, its object being to protect the low lying section of the town against overflow by backwater from the dam.

West Middletown Cut-Off Channel

The accompanying view, Fig. 53, shows the cut-off channel recently completed in the vicinity of West Middletown. The object is to straighten the course of the Miami River by cutting off an objectionable bend, the channel as now built being merely a lead for the river to follow and widen out during flood stages. The bottom width of the channel is 40 feet, the side slopes 1 to 1, and the total length 3600 feet. The excavation amounted to 70,000 cubic yards, and was handled by Cole Brothers Construction Company.

The new channel passes under the eighth span of the Third Street concrete bridge, counting from the west abutment. This span was built larger than the others, by the County, for this purpose. It is hoped that, in time, the Miami will excavate for itself a new bed following the cut-off channel, and that its present bed will silt up and be abandoned. This work was included in the plan at the suggestion of a committee of citizens of Middletown.

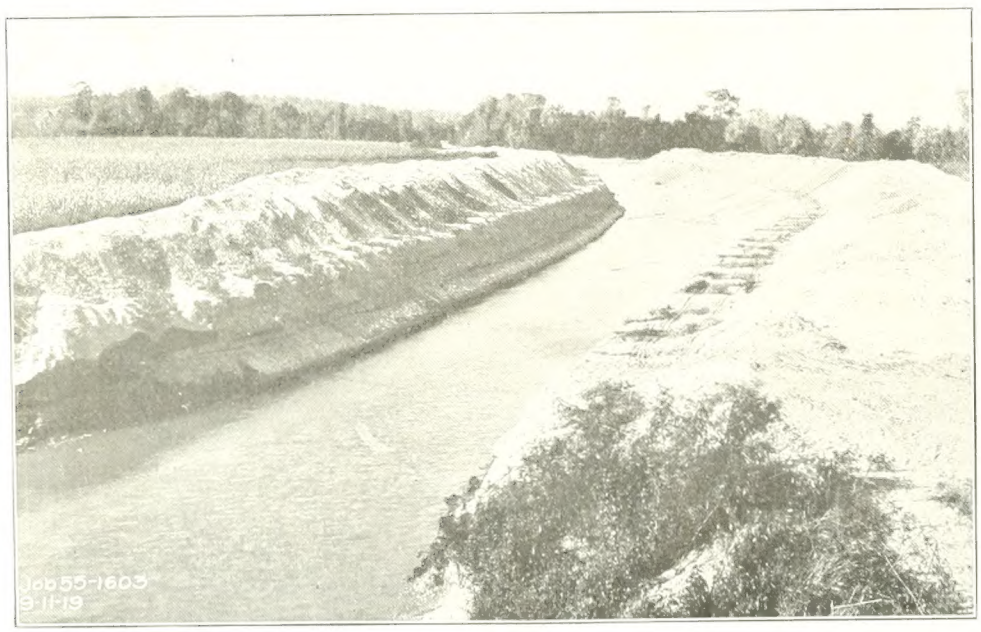

FIG. 53—THE WEST MIDDLETOWN CUT-OFF CHANNEL, SEPT. 11, 1919.